# *RECOGNITION AND LABORATORY DETECTION OF PLAGUE*

Plague is a zoonotic disease caused by the bacterium *Yersinia pestis* transmitted to man through a rodent/flea cycle. Wild rodent plague exists in the western half of the USA, as well as in South America, Africa, and Asia. It is enzootic in most parts of rural California except for the Central Valley. The wild rodents most likely to harbor plague in California include the California Ground Squirrel (*Spermophilus beechii*), the Golden Mantled Ground Squirrel (*S. lateralis*), and several species of Chipmunk (*Tamias spp*.), although many other kinds of rodents also may harbor the disease.

Initial clinical signs and symptoms may be nonspecific with fever, chills, malaise, nausea, prostration, sore throat, and headache. A painful bubo may or may not be present. A history of flea bites and/or camping/hiking in an enzootic area is significant. Veterinarians and veterinary workers can also be exposed to plague infected animals, especially cats from plague endemic areas. If untreated, bubonic plague has a case/fatality rate of 50-60%, and pneumonic plague has a case/fatality rate of close to 100%.

The direct fluorescent antibody test for *Yersinia pestis* is the test of choice if plague is suspected. However, isolation of the organism from blood cultures has actually been the first indication of plague infection in 60% of human cases of plague in California from which the organism was recovered (1980-1997). Occasionally automated systems may not give a reliable identification of *Y. pestis*.

Human plague is considered a public health emergency because of the real possibility that the patient may develop plague pneumonia and spread the disease rapidly. It is a legal requirement that even mere suspicion of plague should be phoned immediately to the local health department.

The California Code of Regulations Section 2596 states that all laboratory specimens submitted for the purpose of establishing a diagnosis of plague shall be examined only in such laboratories as may be designated by the Director of the State Department of Health Services. The laboratory in California so designated is the Department's Microbial Diseases Laboratory (MDL). Whenever a laboratory receives a specimen for the laboratory diagnosis of suspected human plague, such laboratory shall communicate immediately by telephone with the state laboratory for instruction.

Specimens of choice for plague are lymph node aspirates, blood cultures, and sputum. The Microbial Diseases Laboratory offers STAT direct fluorescent antibody (DFA) testing for *Y. pestis* on lymph node aspirates, sputum, and pure cultures. All specimens submitted to the MDL for plague examination should be accompanied by clinical and epidemiological information, including exposure history. A presumptive report will be telephoned to the physician, laboratory, and health department, usually within two hours of receipt of the specimen. The specimen will also be cultured for isolation of the organism. All cultures will be examined biochemically, morphologically, and culturally for identification as *Yersinia pestis*. Lysis by specific bacteriophage is the confirmatory test.

Antibodies to the *Y. pestis* F1 antigen can be detected using the passive hemagglutination assay on acute and convalescent-phase serum samples. Testing of serum should be coordinated through the State• s MDL for forwarding to CDC's Plague Laboratory at Fort Collins, CO.

For information or to submit specimens, please contact the Special Pathogens Unit of the MDL: (510) 540-2255; after hours: (510) 540-2308.